

WHAT IS CLAIMED IS:

1 1. A magnetic disk drive including a magnetic head for writing/reading
2 information to/from a magnetic recording medium and a preamplifier for exchanging
3 read/write information with said magnetic head, said disk drive comprising:
4 two or more types of control function units provided in said magnetic head;
5 signal superposing means for merging two or more types of transmission lines
6 into a single type of transmission line on the preamplifier side of a spring load position of a
7 suspension, said two or more types of transmission lines transmitting control signals for said
8 two or more types of control function units; and
9 signal separating means for dividing said single type of transmission line into
10 two or more types of transmission lines on the magnetic head side of said spring load position
11 of said suspension.

1 2. The magnetic disk drive as claimed in claim 1, wherein:
2 said two or more types of control function units include a first control function
3 unit for implementing a two-stage actuator function and a second control function unit for
4 implementing a flying height control slider function;
5 said signal superposing means merges a first transmission line and a second
6 transmission line into a third transmission line, said first transmission line transmitting a
7 control signal for said first control function unit, said second transmission line transmitting a
8 control signal for said second control function unit, each transmission line consisting of two
9 conductors; and
10 said signal separating means divides said merged third transmission line into a
11 fourth transmission line and a fifth transmission line, said fourth transmission line
12 transmitting a control signal for said first control function unit, said fifth transmission line
13 transmitting a control signal for said second control function unit, each transmission line
14 consisting of two conductors.

1 3. The magnetic disk drive as claimed in claim 2, wherein said signal
2 superposing means superposes a signal of a first frequency with a signal of a second
3 frequency for controlling a heating resistor of said second control function unit and transmits
4 the superposed signal through said third transmission line, said first frequency being able to
5 drive a piezoelectric element of said first control function unit, said second frequency being

6 higher than said first frequency and unable to drive said piezoelectric element of said first
7 control function unit.

1 4. The magnetic disk drive as claimed in claim 3, wherein said signal of said
2 second frequency is made up of a sinusoidal signal.

1 5. The magnetic disk drive as claimed in claim 4, wherein said signal
2 separating means uses interline crosstalk generated from said fourth transmission line to
3 separate said signal of said second frequency and controls said heating resistor of said second
4 control function unit through said fifth transmission line, said fourth transmission line being
5 connected to said third transmission line, which transmits said superposed signal obtained as
6 a result of superposing said signal of said first frequency with said signal of said second
7 frequency.

1 6. A magnetic disk drive comprising:
2 a magnetic recording medium;
3 a magnetic head including
4 a read element for reading information from said magnetic recording
5 medium and providing read signals,
6 a write element for writing information to said magnetic recording
7 medium in response to write signals,
8 a first control function unit, responsive to a first control signal, for
9 effecting a first type of change in an operating characteristic of said magnetic head,
10 and
11 a second control function unit, responsive to a second control signal,
12 for effecting a second type of change in an operating characteristic of said magnetic
13 head;
14 a suspension for supporting said magnetic head, said suspension having a
15 spring load position;
16 a transmission line segment spanning said spring load position;
17 a signal superposition element that receives first and second signals and
18 combines them to provide a combined signal directed along said transmission line segment
19 spanning said spring load position toward said magnetic head; and
20 a signal separation element on said suspension that

21 receives said combined signal after said combined signal has traveled
22 past said spring load position, and
23 directs separate signals along first and second transmission line
24 segments to said first and second control function units, respectively, to provide said
25 first and second control signals.